

### REMARKS

Claims 1-27 are currently pending in the application. Claims 1, 3 and 22 have been amended. Claims 24-33 have been added. No new matter has been added.

The Office Action objects to the drawings for failing to show every feature of the invention specified in the claims. The Applicant has amended claim 2 to reflect the representation of the sensing apparatus in Figure 1. The Applicant believes that all features of the claims are now shown in the drawings and respectfully requests withdrawal of this rejection.

The Office rejects claims 1, 3, 13 and 21 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,411,834 to Nagai. The Applicant respectfully disagrees and traverses the rejection.

The Nagai '834 reference is directed to a biological sensor having an annul portion 23 protecting a sensor portion 1 and a connector 22. Lead wires 4 are encased in a tube 5 formed of a synthetic resin (col. 4, lines 57-59). The tube 5 is woven into a tubular shape by a metal wire 101, and further covered with a synthetic resin tube 102 forming a plasticity material 24 (col. 4, lines 60-65).

The present invention is directed to a sensing apparatus comprising a cable having a first end and a second end, a connector residing at the first end of the cable, and a sensor module residing at the second end of the cable. In some preferred embodiments, the cable comprises a core, a conductive element helically wrapped around the core, and a first tubing covering the core and the conductive element, wherein the core resides in the center of the cable.

As amended, the Nagai '834 reference fails to meet the limitations of claim 1. In particular, the Nagai '834 reference fails to meet the limitation of "a conductive element extending from the connector to the sensor module". Indeed, with reference to Figure 1, the lead wires 4 and tube 5, which is shaped by the metal wire 101 (the conductive element) do not "extend[] from the connector to the sensor module" as required by amended claim 1. Rather, the lead wires 4 and tube 5 extend from the connector 22 to the plasticity material 24.

Further, in addition to the above, the Applicant asserts that the Nagai '834 reference fails to teach a "cable having ... a core". The Office states that the cable has a core 5 and a first tubing 102, with a conductive element 101 wrapped around the core. The Applicant respectfully disagrees with the Office's description and notes that the Nagai '834 reference clearly states that a tube (core) 5 encases the lead wires 4 (cable). A 'core' is typically understood as being the interior portion of an object (see for example, Webster's Ninth New Collegiate Dictionary), and thus, the hollow tube 5 is not the *core* of the wires 4, as required in claim 1, but rather *surrounds or encases* the wires. A proper interpretation of the term core in relationship to the wire shows that this claim limitation is not met by the Nagai '834 reference. In light of the above arguments, the Nagai '834 reference fails to meet the limitations of claim 1. Claim 21 has been similarly amended, and for the reasons set forth above, the Nagai '834 reference fails to meet claim 21, as amended. As the Nagai '834 reference fails to meet independent claim 1, dependent claims 3 and 13 are also not met.

The Office further rejects claim 1, 3, 6, 13 and 21 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,456,863 to Levin et al. The Applicant respectfully disagrees and traverses this rejection.

The Levin reference is directed to a catheter having a distal end assembly 12. The catheter includes a handle 14, a guide tube 16, distal end assembly 12, a tip 18 and an interconnection cable 20 that is engagable with a connector (not shown). The connector is disposed in the proximal end of the handle 14.

The Levin reference fails to meet the limitations of original claim 1, and amended claim 1. In particular, in the original claim, the Levin reference fails to meet the limitation of "a sensor module residing at the second end of the cable". A first end of the cable 20 in the Levin device extends to the connector. However, unlike the present invention, the second end of the cable 20 in the Levin device extends to the handle, not a sensor module. Further, the Levin reference does not even include a sensor module, rather, the tip 18 is merely a conduit for a radio frequency energy used to ablate heart tissue, which is not sensing the heart tissue but, for example, is cutting or eroding the heart tissue. Thus, as original presented, the Levin reference fails to meet the limitations of claim 1. The Levin reference further fails to meet the additional limitation of

“a conductive element extending from the connector to the sensor module”. The electrodes 50, 52, 54, 56, 58 and 60 are only disposed on the central lumen 44 and do not “extend[] from the connector to the sensor module”. As discussed above, the Levin reference fails meet this limitation as it fails to teach a sensor module.

As claim 21 is similar to claim 1, for the reasons set forth above, the Levin reference fails to meet original claim 21, or as amended. As independent claim 1 is not met by the Levin reference, dependent claims 3, 6 and 13 are also not met.

The Office further rejects claim 1, 2, 13 and 21 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,957,110 to Vogel et al. The Applicant respectfully disagrees and traverses this rejection.

The Vogel device is a guidewire system comprising an elongated shaft 12 having a distal end 12a and a proximal end 12b. The guidewire 10 includes a distal tip region 14 coupled to the distal end 12a of the shaft 12. The distal tip region 14 includes a distal electrode 20 and a proximal electrode 22 spaced apart by an insulating member 24. The distal electrode 20 and the proximal electrode 22 are electrically connected through shaft 12 by conductive wire 26 and conductive tube 26, respectively, to the proximal end of the guidewire 10. Wire 26 and tube 28 are connected by leads 30 and 32, respectively, to an external excitation and sensing circuit 34.

The Vogel reference fails to meet the limitations of original claim 1, and amended claim 1. In particular, the Vogel reference fails to meet the limitation of “a sensor module residing at the second end of the cable”. In Vogel, the sensing circuit 34 is coupled to the wire 26 and tube 28 via leads 30 and 32. The sensing circuit, however, fails to reside at the second end of the cable, but rather, both the connector 50 and the sensing circuit 34 resides at the proximal end 12b of the cable. As both the sensing circuit 34 and the connector 50 resides at the proximal end 12b the limitations of claim 1, as originally presented or amended, are not met by the Vogel reference.

As claim 21 is similar to claim 1, for the reasons set forth above, the Vogel reference fails to meet original claim 21, or as amended. As independent claim 1 is not met by the Vogel reference, dependent claims 2 and 13 are also not met.

The Office further rejects claim 1, 3, 6, 10, 11, 13 and 21 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,295,476 to Schaenzer. The Applicant respectfully disagrees and traverses this rejection.

The Schaenzer reference is directed to lead conductor fracture visualization apparatus. In the Schaenzer device, a connector assembly is formed at a proximal end of a lead body 40, wherein the connector assembly comprises a lead bifurcation, splitting off two conductors within the lead body 40 which are coupled to electrodes 44, 46. In one embodiment, the lead body is formed in a co-axial manner, wherein three coiled wire conductors 172, 174, 176 are each enclosed within outer insulating sheath 160, 168 and innermost tubular sheath 170, respectively. The wire conductors are irradiated such that a fracture in the sheath surrounding the wire will allow a radiation leak from the wire, thereby indicating the fracture in the sheath.

The Schaenzer reference fails to meet the limitations of claim 1. In particular, the Schaenzer reference fails to meet the limitation that “the conductive element being helically wrapped around a substantial length of the core”. Indeed, the Schaenzer core 176 is covered by sheath 170, and conductive wire 174 is wrapped around the sheath 170. In contrast to the present invention, core 176 *is* the conductive element, which itself is wrapped by a lead sheath to contain radiation. As such, the limitations of claim 1 are not met by the Schaenzer reference. As claim 21 is similar to claim 1, for the reasons set forth above, the Schaenzer reference fails to meet amended claim 21. As the Schaenzer reference fails to teach independent claim 1, the Schaenzer reference also fails to teach the limitations of dependent claims 3, 6, 10, 11 and 13.

The Office further rejects claim 1, 13-16 and 21 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 4,867,557 to Takatani et al. The Applicant respectfully disagrees and traverses this rejection.

The Takatani reference is directed to a reflection type oximeter comprising light emitting diodes for detecting a change in absorption due to a change in oxygen saturation of hemoglobin in blood of a tissue of a living body. Beams of light are applied to living tissue which are reflected back and received by light receiving element 17. The intensities of the light beams transmitted and received are evaluated to determine the quantity of hemoglobin and oxygen saturation of the body tissue.

The Takatani reference fails to meet the limitations of amended claim 1. In particular, the Takatani reference fails to meet the limitation of “a conductive element extending from the connector to the sensor module, the conductive element being helically wrapped around a substantial length of the core”. Not only does the Takatani reference fail to discuss the placement of a conductive element and cable, the Takatani reference fails to teach or suggest that any “inherent” cable has a conductive element wrapped around the core of the cable. As claim 21 is similar to claim 1, for the reasons set forth above, the Takatani reference fails to meet amended claim 21. As the Takatani reference fails to teach independent claim 1, the Takatani reference also fails to teach the limitations of dependent claims 13-16.

The Office rejects claim 4 under 35 U.S.C. §103(a) as being unpatentable over Nagai '834 in view of KenKnight et al. The Applicant respectfully disagrees and traverses this rejection. For the reasons set forth above, the limitations of claim 1 are not met by the Nagai '834 reference. As claim 4 is dependent, in part, from claim 1, claim 4 cannot be unpatentable over Nagai '834 in view of KenKnight.

The Office rejects claim 5 under 35 U.S.C. §103(a) as being unpatentable over Levin in view of Yang et al. The Applicant respectfully disagrees and traverses this rejection. For the reasons set forth above, the limitations of claim 1 are not met by the Levin reference. As claim 5 is dependent, in part, from claim 1, claim 5 cannot be unpatentable over Levin in view of Yang.

The Office rejects claims 7-9 under 35 U.S.C. §103(a) as being unpatentable over Levin. The Applicant respectfully disagrees and traverses this rejection. For the reasons set forth above, the limitations of claim 1 are not met by the Levin reference. As claims 7-9 are dependent, in part, from claim 1, claims 7-9 cannot be unpatentable over Levin.

The Office rejects claims 7-9 under 35 U.S.C. §103(a) as being unpatentable over Schaenzer. The Applicant respectfully disagrees and traverses this rejection. For the reasons set forth above, the limitations of claim 1 are not met by the Schaenzer reference. As claims 7-9 are dependent, in part, from claim 1, claims 7-9 cannot be unpatentable over Schaenzer.

The Office rejects claims 11 and 12 under 35 U.S.C. §103(a) as being unpatentable over Nagai '834 in view of U.S. Patent No. 6,143,150 to Nagai. The Applicant respectfully disagrees and traverses this rejection. For the reasons set forth above, the limitations of claim 1 are not

met by the Nagai '834 reference. As claims 11 and 12 are dependent, in part, from claim 1, claims 11 and 12 cannot be unpatentable over Nagai '834 in view of Nagai '150.

Finally, the Office rejects claims 17-20 under 35 U.S.C. §103(a) as being unpatentable over Nagai '834 in view of Ward et al. The Applicant respectfully disagrees and traverses this rejection. For the reasons set forth above, the limitations of claim 1 are not met by the Nagai '834 reference. As claims 17-20 are dependent, in part, from claim 1, claims 11 and 12 cannot be unpatentable over Nagai '834 in view of Ward.

Claims 22 and 23 are objected to as being dependent upon a rejected claim base. Claim 22 has been rewritten in independent form. As such, the Applicant believes that claims 22 and 23 are now in allowable form.

Claims 24-27 are newly added. Claims 24 and 25 are directed to the placement of the spacing element, and claims 26-27 are directed to the material composing the core. Claim 28 is directed to the length of the core, and claims 29-33 are directed to the spacing elements.

The Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. If the Examiner believes that further modifications are required to place the application in allowable form, the Examiner is invited to contact the undersigned by telephone to expedite the allowance of this application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 06-1447. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1447. If any extensions of time are needed for timely acceptance of papers

submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 50-0872.

Respectfully submitted,

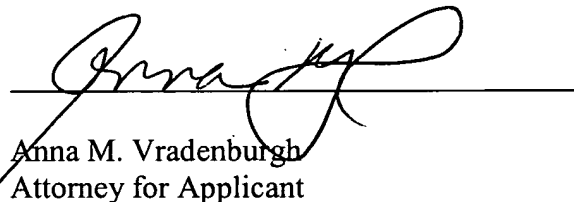
Date: January 5, 2004

FOLEY & LARDNER

Customer Number: 23392

Telephone: (310) 975-7963

Facsimile: (310) 557-8475



Anna M. Vradenburgh  
Attorney for Applicant  
Registration No. 39,868